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**The Relations Between Maternal Mind-Mindedness, Parenting Stress and Obstetric
History Among Chinese Mothers**

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The Relations Between Maternal Mind-Mindedness, Parenting Stress and Obstetric History Among Chinese Mothers

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Abstract

Relations between maternal mind-mindedness, parenting stress and obstetric history were investigated in a Chinese sample comprising of 96 mother-infant dyads (infants' mean age = 15.95 months, mean maternal age = 30 years). Parenting stress and obstetric history were assessed through questionnaires while mind-mindedness was observed through a 10-minute video recording of mother-infant interactions. Results indicated that among mothers who perceived the pregnancy to have been difficult, those who had planned to conceive were more likely to comment appropriately on their infants' mental states than those who had unplanned conceptions. Appropriate mind-related and non-attuned comments were unrelated to mothers' recollections of their first contact with their newborns. Mothers who displayed a highly emotional reaction of an exclusively positive nature were in the lower parent distress category and experienced lower total parenting stress scores than those who responded neutrally when their babies were first given to them. Controlling for maternal education and income, mothers who were more mind-mindedness had lower levels of parenting stress. Main carer status and daily time spent with child were related to parenting stress. The results are discussed in relation to the need to consider socio-cultural factors that might shape antenatal

perceptions and influence parenting stress which in turn affect a mother's relationship with her child.

Keywords: Chinese mother-infant dyads, maternal mind-mindedness, parenting stress, obstetric history

The Relations Between Maternal Mind-Mindedness, Parenting Stress and Obstetric History Among Chinese Mothers

Introduction

While studying human genetic helps us understand babies' development, it is impossible to study their development separate from their mothers. The physical closeness and strong reciprocal dependency of the infant-mother relationship have enabled researchers to investigate many aspects of early infant-mother interactions. Maternal mind-mindedness is one specific aspect of the relationship between a child and her mother that involves a mother's proclivity to "treat her infant as an individual with a mind rather than merely as a creature with needs that must be satisfied" (Meins, Fernyhough, Fradley, & Tuckey, 2001, p. 638). The concept of mind-mindedness was introduced by Meins (1997), who argued that the sensitivity to children's physical and emotional needs should be distinguished from sensitivity to their mental states, as manifested in children's ongoing behaviours. Three criteria have been used to show a caregiver's mind-mindedness tendency to focus on their children's mental life: (1) focusing on mental attributes when describing their children (Meins, Fernyhough, Russell, & Clark-Carter, 1998); (2) commenting either appropriately or not-attuned to infants' mental process and feeling when interacting with the children during the first year of the life (Meins et al., 2012); and (3) attributing meaning to infants' utterance when they begin to talk (Meins, 1998).

In the Western cultures, there is now an established literature on the relations between maternal mind-mindedness and some key developmental milestones in the early years. Past research has highlighted that maternal discourse during mother-child interaction in the early years of children's lives serves as an important predictor of children's understanding of mind and emotion (Symons, 2004). Mothers of securely attached children were more likely to

describe their children in terms of their mental characteristics rather than their physical or behavioural qualities (Meins et al., 1998). A longitudinal study found that maternal sensitivity and appropriate mind-mindedness independently contributed to attachment security (Meins et al., 2001).

Many Western studies have also explored the circumstances under which maternal mind-mindedness would vary. Previous studies have found that a mother's mind-mindedness is related to both parenting stress and negative behaviours towards the child during interaction at home (McMahon & Meins, 2012; Walker, Wheatcroft, & Camic, 2011). McMahon and Meins (2012) showed that mothers who used more mental state words when describing their children experienced lower parenting stress and showed less hostility than mothers who used less mental state words. Meins and Fernyhough (1999) reported that maternal attribution to the meaning of infants' nonverbal vocalization at 11 or 13 months was related to their proclivity of mind-mindedness tendencies in describing their children's mental states 16 months later. However, there was no strong evidence to support maternal mind-mindedness was related to a mother's socioeconomic status (SES) (Meins et al., 1998), educational level, or previous experiences of motherhood (Meins et al., 2002).

Mind-mindedness is likely to evolve during pregnancy when mothers start to represent their infants before they are born (Arnot & Meins, 2008). Previous Western research has found appropriate mind-related comments and non-attuned mind-related comments were related to different aspects of mothers' obstetric history (Meins, Fernyhough, Arnott, Turner, & Leekam, 2011). Meins et al.'s (2011) study showed that among mothers who evaluated their pregnancy experience to be easy, mothers who had planned to conceive showed more tendency to comment on their children's internal states than mothers who did not plan to conceive. Among mothers who evaluated the pregnancy experience to be difficult, planned pregnancy was not related to appropriate mind-mindedness comments.

Maternal Mind-mindedness Research in Non-Western Cultures

Although the construct of maternal mind-mindedness has received considerable attention in the Western literature, there are relatively few studies that explored maternal mind-mindedness in non-Western contexts. A recent cross-cultural study revealed that parents in the UK showed higher level of mind-mindedness than parents in Hong Kong, and mind-mindedness accounted for cultural differences in children's theory of mind development (Hughes, Devine & Wang, 2017). Another recent study reported that lie-telling behavior of Hong Kong children was predicted by parental mind-mindedness and children's age (Wang, Zhu, & Wang, 2017). These two studies examined mind-mindedness of Hong Kong parents with children aged 3 to 6 years. To obtain a representational measure of parental mind-mindedness, both studies used a brief 5-minute interview asking Hong Kong parents about their thoughts and feelings about their children.

Several studies of mind-mindedness in the non-western cultures were published in non-English languages. A Korean study showed parenting stress mediated the relation between maternal mind-mindedness and parenting behaviours (Kim & Lim, 2014). Moreover, maternal mind-mindedness influenced preschooler's emotional intelligence (Kim & Lim, 2014). A Japanese study showed that maternal mind-mindedness when infants were 6 months positively predicted children's emotion understanding and verbal ability at 48 months (Shinohara, 2011). It is important to note that Japanese mothers hold different cultural values beliefs about their children than other Asian ethnic groups (Md-Ynus, 2005). In contrast to Japanese parents who strongly believed that mothers were primarily responsible for taking care of their children, Chinese parents believed that child care is not a mother's sole responsibility but a collaborative responsibility among family and extended family (Mori, Liu, Otsuki, Mochizuki, & Kashiwabara, 2012). Another study that explored maternal sensitivity, mind-mindedness and children's explorative behaviours with 63 Chinese mother-infant dyads

found a positive correlation between maternal sensitivity and mind-mindedness when infants were 6 months of age and infant's explorative behaviours at 13 months (Wang & Wen, 2011). This study would have been more useful if it had included potentially confounding variables such as a mother's SES. None of the non-Western studies reported here have examined the relations of obstetric history with maternal mind-mindedness and parenting stress.

The present research makes a major contribution to research on maternal mind-mindedness by demonstrating whether Chinese mothers' mind-mindedness during the infancy stage is related with parenting stress and obstetric history, considering intra-cultural differences in child caretaking practices (mother or grandparents as main carer and daily time spent with children). There are several reasons why it is important to explore the relations of maternal mind-mindedness with parenting stress and obstetric history and examine intra-cultural differences within the Chinese culture.

Firstly, China introduced the one-child policy in 1979 in order to control fertility rate (Fong, 2006). Although China ended its decades-long one-child policy in 2015, a generation of Chinese were born and grown up in a one child family environment (Li, 2016). This policy might have impacted parental thoughts, attitudes and behaviours on their child rearing practices. While the one child policy helped parents to focus their investments on children's educational quality and prolong the educational years, it is more likely for the child who lives in the family as the only child to develop weak psychological well-being and to be characterised as self-centered, lack of independence, lack of cooperation competence and having a strong sense of subjectivity (Zhen, Hou, & Liu, 2014). Although overindulgence towards the only child might contribute to negative behavior in the child, parental attention on a one-to-one basis with the only child might contribute to the child's excelling in intellectual and linguistic skills (Rosenberg & Jing, 1996).

Secondly, Chinese parents are highly lenient towards their infants and young children (Lai, Zhang & Wang, 2000). In contrast to Western parents who encourage independence, assertiveness, and creativity, Chinese parents place great emphasis on obedience, proper conduct, and stick to social obligation. Chinese parents generally discourage their children from displaying adventurous behaviours and prohibit them from aggressive behaviours. Mothers' endorsement of Chinese cultural values and perceived parenting stress influenced their parenting styles and interaction with their children (Xu et al., 2005).

Thirdly, the frequency in which people talk about mental states differ widely across cultures (Lillard, 1998) and caregiving strategies and socialization goals vary widely across cultures (Keller, 2013). Cross-cultural studies have shown that parents in Asia were less likely to describe their children using mental attributes (Hughes et al., 2017) and rely more on behaviour-descriptive verbs in person descriptions (Mass, Kurasawa, Politi, & Suga, 2006; Wang, 2004) than parents in the West. While mothers are generally the principal caregiver in some cultures, multiple caregiving is the norm in other cultures (Bornstein, 2013). Grandparents play an important role in childcare to grandchildren in China (Chen & Liu, 2012; Chen, Liu, & Mair, 2011; Ko & Hank, 2013). Mothers who have higher levels of support from family and friends have better mental health outcomes than those with less support (Bunting & McAuley, 2004), which in turn might affect parenting behaviour. It is not clear whether child caretaking practices (mother or grandparents as main carer and daily time spent with children) are related to maternal mind-mindedness and parenting stress in the Chinese culture.

Lastly, many researchers have reported that Chinese mothers appear to adhere to traditional Chinese pregnancy restrictions or antenatal taboos such as avoid eating "cold foods" (e.g. ice-cream and watermelon) and strenuous physical work (e.g. moving home or home renovations) (Lau, 2012; Lee et al., 2009). Cultural fears such as miscarriage, stillbirth,

death of the mother and imperfections in the newborn are what drive pregnant Chinese women to observe dietary and behavioural restrictions (Lau, 2012; Lee et al., 2009).

Traditional pregnancy restrictions might influence a mother's willingness and ability to view of her unborn child as separate entity and begin to interpret her child's behaviour with references to intentions or desires before her child is born. Pregnant Chinese women who observed the traditional pregnancy restrictions have been shown to experience higher levels of depression in late pregnancy and during childbirth (Lee et al., 2009) and poor physical health-related quality of life (Lau, 2012). This suggests that Chinese mothers' pregnancy and birth appraisals might be related to maternal mind-mindedness and parenting stress.

The Current Study

To our knowledge, this is the first study on mind-mindedness in infancy in non-Western mothers to be published in English. The aim of the current study was to examine the conditions under which Chinese mothers' proclivity to view their infants as psychological beings would vary by investigating the relations between maternal mind-mindedness, parenting stress, and obstetric history. In contrast to Hughes et al. (2017) and Wang et al. (2017), the present study obtained a richer data by exploring the natural interactions between Chinese mothers and their infants in their home environment. In contrast to Wang and Wen (2011), the present study included maternal education and income as potentially confounding variables.

The first objective was to analyse whether obstetric history was related to mind-mindedness and parenting stress among Chinese mothers. We also considered whether main carer status and daily time spent together with child influenced the relations between obstetric history, mind-mindedness and parenting stress. We hypothesized that higher levels of maternal mind-mindedness and lower levels of stress would be associated with planned

pregnancy, perceiving the pregnancy as having been easy, and positive recollections of first contact with the baby. Mothers who experienced discrepancies between pre-baby expectation and postpartum realities might have less positive parenting practices which may contribute to parenting stress. Care taking support from grandparents might act as a buffer for mother's mental health. We also hypothesized that among mothers who did not recollect positive reactions to first contact with their children, those who were main carers experienced more parenting stress than those who were not main carers. Among mothers who did not recollect positive reactions to first contact with their children, those who spent more daily time together with their children experienced more parenting stress than those who spent less time together with their children. The second objective was to explore whether maternal mind-mindedness was related to parenting stress. We hypothesized that higher levels of mind-mindedness would be associated with lower levels of stress.

Methods

Participants

Participants were 96 mother-infant dyads living in Sichuan Province, China. They were all living in the cities. Among the infants, 46 were boys (mean age = 14.97, $SD = 4.46$) and 50 were girls (mean age = 16.82, $SD = 3.53$). Mean maternal age was 30 years ($SD = 4.0$, range 22 to 42). All participants were recruited from posters advertisements in woman and children hospitals, children's play groups, and nurseries in the cities of Chengdu and Chongqing, China. Mothers were informed that the study focused on the development of relationship between mother and infant. Parents gave full informed consent before the study commenced. Children had no known physical or mental disabilities. All mother-infant dyads used Mandarin-Chinese as the dominant language in their homes.

Procedure

The visits were conducted by two research assistants who were trained in administering the questionnaires and recording the free play sessions. Mothers were first asked to complete the Parenting Stress Index (PSI Short Form, Abidin, 1995) and a questionnaire about socio-demographic information and obstetric history. Mothers were then instructed to play with their children as they would during spare time at home. Ten-minutes free play session, using a set of age-appropriate toys brought along by the research assistants, was video recorded. Each home visit lasted 70 to 90 minutes.

Measures

Socio-demographic factors

Mothers completed an investigator-devised questionnaire gathering socio-demographic information, including maternal education, family income, profession, number of children in the family, main carer status, daily time spent with children, and whether living with parents. The demographic information is shown in Table 1.

Obstetric history variables

The obstetric history questions (pregnancy history and birth experience) were derived from Meins et al. (2011) and were translated and back translated by two Chinese and English bilingual researchers. With regards to pregnancy history, mothers were asked (a) whether their pregnancies had been planned; (b) whether they personally felt the pregnancy had been easy or difficult; and (c) if they experienced any complications during the pregnancy (providing details of any complications). With respect to birth experience, mothers were asked (d) if they experienced any complications during labour (providing details of any complications); (e) if the infant had suffered from any medical problems or needed medical attention at birth; and (f) how they feel when their babies were given to them. Following Meins et al. (2011), these five obstetric history questions are considered as separate variables.

In line with Meins et al. (2011), responses for recollection of first contact with the baby were classified into the following six categories: (a) a highly emotional reaction of an exclusively positive nature (e.g. “I felt an overwhelming love for my baby”), (b) an emotional reaction of an exclusively positive nature (e.g. “I was happy meeting my little one”), (c) a mixed emotional response (e.g. “I was happy but scared as well”), (d) a neutral response (e.g. “I felt relieved”), (e) a negative emotional response (e.g. “I was upset”), and (f) a focus purely on the mother’s physical reaction (e.g. “I was sweaty and exhausted”).

Maternal mind-mindedness

Consistent with previous studies of infants, maternal mind-mindedness were assessed through a 10-minute free play session between the mothers and their infants (Meins & Fernyhough, 2015). Mothers’ and infants’ conversations during the sessions were transcribed verbatim, and all mothers’ comments that included an internal-state language referring to the child’s mind or emotion were identified from the transcripts. For maternal mind-mindedness coding, a trained researcher who was blind to all other measures and to the hypotheses of the study watched the entire video-taped interaction and classified each mind-related comment on the transcript as appropriate or non-attuned using the procedures outlined in Meins and Fernyhough (2015).

Comments were considered as mind-related comments when they fit at least one of these criteria: (a) mother used an explicit internal state term to comment on what the infant might be thinking, experiencing or feeling; and (b) put words into the infant’s mouth with the mother talking on the infant’s behalf. Each comment was then coded as appropriate mind-related comments and non-attuned mind-related comments. Appropriate mind-related comments include those that met one of these criteria: (a) the researcher agreed with the mother’s reading of the infant’s current internal state; (b) the comment linked current activity

with similar events in the past or future; and (c) the comment served to clarify how to proceed after a lull in the interaction. Following Meins and Fernyhough (2015), the number of mind-related comments were summed into a total score, thereby yielding two scores for analyses, the total number of the appropriate mind-related comments and the total number of non-attuned mind-related comments. In order to control for differences in verbosity, the two scores were also expressed as a proportion of the total number of comments made.

A second trained researcher who was blind to all other measures and to the hypotheses of the study, coded the number of mind-minded comments of a randomly selected 75% of the mother-infant interactions. Interater agreement for the appropriate and non-attuned classification was $\alpha = 0.90$. Disagreements were resolved by discussion.

Parenting stress

Parenting stress was assessed using the PSI Short Form (Abidin, 1995), a 36-item questionnaire with five-point Likert scale (ranging from extremely high to, high, low and extremely low) evaluating the magnitude of parenting stress. Three domains were assessed: (a) Parental Distress; (b) Parent-Child Dysfunctional Interaction; and (c) Child Behaviour Characteristics (Difficult Child). A total parenting stress score is derived from the three scales. This instrument has previously been validated among Chinese mothers in Hong Kong (Tam, Chan, & Wong, 1994).

Results

Preliminary analyses

Socio-demographic variables

With regards to associations between mother–infant interaction variables and infant gender, there was no significant difference between mothers of girls and mothers of boys in

the use of appropriate and non-attuned mind-related comments and PSI scores. Therefore, child gender was not considered further in the analyses reported below.

Table 2 shows that income was not significantly related with appropriate mind-related comments, non-attuned mind-related comments and parent-child dysfunctional interaction status. However, income was significantly associated with difficult child status, parent distress status and parenting stress total status. Post hoc pairwise contrasts showed that mothers in the lowest income group (< 100,000 rmb) faced higher parent distress than mothers in the higher income group (10,000rmb - 30,000 rmb, $p = .04$) and rated their child as more difficult than mothers in the highest income group (> 30,000 rmb, $p = .01$). Mothers in the lowest income group faced higher parenting stress total status than mothers in the highest income group ($p = .01$). These results indicated that higher income was associated with (a) lower parenting stress total status, (b) lower difficult child status, and (c) lower parent distress status. Income was controlled for or used as a covariate in subsequent analyses.

ANOVA revealed main effect of maternal education on appropriate mind-related comments (Table 2). Post hoc pairwise contrasts showed that mothers who had a Masters or PhD degree used more appropriate mind-related comments than mothers who did not have a degree ($p < .048$). There was no main effect of maternal education on frequency and percentage of non-attuned mind-related comments. Maternal education was controlled for or used as a covariate in subsequent analyses.

Obstetric history variables

Three significant relations were found among the obstetric history variables. Planned conception was significantly related with pregnancy evaluation, ($\chi^2(1) = 3.98$, $p = .046$, $w = .21$). Mothers who had planned to conceive (65.6%) were more likely than mothers who had not planned to conceive (34.4%) to have a positive evaluation of their pregnancy. Among

mothers who have negative evaluation of their pregnancy, there were more mothers who planned to conceive (84.8%) than mothers who had not planned to conceive (15.2%). Pregnancy evaluation was significantly related with complications during pregnancy, ($\chi^2(1) = 6.01, p < .05, w = .01$). Mothers who had a positive evaluation of their pregnancy (69.5%) were less likely to have complications during pregnancy than mothers who had a negative evaluation of their pregnancy (30.5%). Complication during labour was significantly associated with neonatal medical problems, ($\chi^2(1) = 8.65, p = .003, w = .30$). Mothers who did not have complications during labour (95.1%) were less likely than mothers who had complications during labour (4.9%) to have infants who suffered from any medical problems or needed medical attention at birth.

Main findings

Relations between obstetric history, maternal mind-mindedness and main carer status

We explored the relations between the obstetric history variables and mind-mindedness variables using ANCOVA, with obstetric history variables (planned pregnancy, pregnancy evaluation, and recollection of feelings after birth) entered as fixed factors and income, pregnancy complications, labour complications and neonatal medical problems entered as covariates. As shown in Table 3, there was a main effect of pregnancy evaluation and interactions between planned pregnancy and pregnancy evaluation and between pregnancy evaluation and feelings at birth on mothers' appropriate mind-related comments scores. Post hoc tests revealed no significant differences in appropriate mind-related comments in mothers who perceived the pregnancy to have been easy ($M = .77, SD = .40$) and those who perceived it to have been difficult ($M = .64, SD = .47, t(91) = 1.35, p = .18, d = .30$). Among mothers who perceived the pregnancy to have been easy, there were no significant differences in appropriate mind-related comments and their recollection of

feelings at birth ($F(4, 58) = .39, p = .81, \eta^2 = .03$). Neither were there significant differences in appropriate mind-related comments and recollections of feeling at birth among mothers who perceived the pregnancy to have been difficult. ($F(3, 32) = .19, p = .90, \eta^2 = .02$).

However, among mothers who perceived the pregnancy to have been difficult, those who had planned to conceive scored more highly for appropriate mind-related comments ($n = 28, M = .71, SD = .43$) than did those who had unplanned conceptions ($n = 5, M = .20, SD = .44$), $t(31) = 2.46, p = .02, d = .88$). On the other hand, among mothers who perceived the pregnancy to have been easy, there was no significant difference in scores for appropriate mind-related comments between mothers who had planned to conceive ($n = 40, M = .71, SD = .43$) and those who had not ($n = 20, M = .88, SD = .31$), $t(49) = 1.75, p = .09, d = .24$).

Independent samples t tests revealed that among mothers who perceived the pregnancy to have been easy, there were no significant differences in appropriate mind-related comments between those who were main carers ($n = 33, M = 4.76, SD = 5.21$) and those who were not main carers ($n = 26, M = 5.99, SD = 4.14, t(57) = .19, p = .85, d = .03$). Partial correlations, controlled for maternal education and income, showed that among mothers who perceived the pregnancy to have been easy, there were no significant differences in daily time spent together with child and appropriate mind-related comments ($r(93) = .20, p = .14$).

Relations among obstetric history, parenting stress and main carer status

A one-way ANCOVA, with maternal education and income as covariates, showed a main effect of emotional valence of recollections of first contact with the infant on parent distress status ($F(4, 87) = 4.31, p = .003, \eta^2 = .17$). Post hoc pairwise contrasts showed that mothers who displayed a highly emotional reaction of an exclusively positive nature were in

the lower parent distress status than those who responded neutrally when the baby was first given to them ($p = .007$).

A one-way ANCOVA, with maternal education and income as covariates, showed a main effect of emotional valence of recollections of first contact with the infant on total parenting stress scores ($F(4, 87) = 3.94, p = .005, \eta^2 = .15$). Post hoc pairwise contrasts revealed that mothers who displayed a highly emotional reaction of an exclusively positive nature were in the lower total parenting stress scores than those who responded neutrally when the baby was first given to them ($p < .05$).

Independent samples t tests showed that among mothers who recollected neutral reactions to first contact with their children, those who were main carers ($n = 6, M = 3.67, SD = .82$) experienced more parental distress scored than those who were not main carers ($n = 7, M = 2.43, SD = .53, t(11) = 3.29, p = .007, d = 1.98$). Among mothers who recollected neutral reactions to first contact with the child, those who were not main carers ($n = 6, M = 2.43, SD = .79$) experienced more parent-child dysfunctional interaction status than mothers who were main carers ($n = 7, M = 1.50, SD = .55, t(11) = 2.42, p = .03, d = 1.46$). Partial correlations, controlling for maternal education and income, showed that among mothers who recollected neutral reactions to first contact with the child, daily time spent together with child was significantly correlated with parenting stress total status ($r(8) = -.67, p = .03$).

Relations between maternal mind-mindedness and parenting stress

The results of the partial correlations, controlling for maternal education and income, among mind-mindedness and parenting stress variables are shown in Table 4. The PSI scores were significantly intercorrelated. Percentage of appropriate mind-related comments was significantly negatively correlated with parent-child interaction ($r(89) = -.23, p = .03$) and

parenting stress total status ($r(89) = -.22, p = .04$), controlling for maternal education and income.

A one-way ANCOVA, with maternal education as a covariate, showed a main effect of parenting stress total status on appropriate mind-mindedness comments ($F(3, 92) = 4.00, p = .01, \eta^2 = .12$). Post hoc pairwise contrasts showed that mothers in the extremely low stress group obtained higher scores on appropriate mind-mindedness comments than those in the high average stress group ($p = .01$). However, when maternal education and income were included as covariates, there were no main and interaction effects of parenting stress total status on appropriate mind-mindedness comments ($F(12, 92) = 1.83, p = .05, \eta^2 = .21$).

Discussion

The first objective of the present study was to investigate whether obstetric history was related to mind-mindedness and parenting stress, taking the impact of child caretaking practices (mother or grandparents as main carer and daily time spent with children) into consideration. Maternal mind-mindedness was related to different aspects of obstetric history. Chinese mother's appropriate mind-related scores were associated with an interaction between planned pregnancy and planned evaluation, with planned conception being positively associated with appropriate mind-related comments only for mothers who perceived the pregnancy to have been difficult.

The associations between maternal mind-mindedness and mothers' recollections of pregnancy and birth are in line with those of previous Western studies (Meins et al., 1998; Meins et al., 2002) and support the idea that similar to Western mothers, Chinese mothers' mind-mindedness is shaped by their experiences of pregnancy, birth and early parenting. However, the current results slightly differed from Meins et al. (2011) who showed that among mothers who perceived the pregnancy to have been easy, those who had planned to

conceive were more likely to employ appropriate mind-related comments than those who had unplanned conceptions. The current study found that among Chinese mothers who perceived the pregnancy to have been difficult, those who had planned to conceive were more likely to comment appropriately on their infants' mental states than those who had unplanned conceptions. This result coincided with the significant association between planned conception and pregnancy evaluation found in the present study. Among mothers who had negative evaluation of their pregnancy, there were more mothers who had planned to conceive than mothers who had not planned to conceive. A possible explanation for this might be due to cultural differences in beliefs and practices about pregnancy. Chinese women who are pregnant "assume a 'sick role' in which they depend heavily on others for assistance" (Abbato, 2011, Pregnancy, para. 1). Hence, some Chinese mothers in the present study might have evaluated their pregnancy negatively even though they had planned to conceive. A mother's attitude towards her pregnancy is likely to affect her relationship with her child. It seems possible that once she recovered from birth, a sensitive and attuned mother would comment appropriately on their infants' mental states.

Appropriate mind-related and non-attuned comments were unrelated to mothers' recollections of their first contact with their newborns. This result differed from Meins et al. (2011) who reported that mothers who recollected mixed, neutral, or negative emotions or focused solely on their physical reaction to birth were more likely to comment in a non-attuned manner on their infants' internal states than mothers who recalled emotional reactions of an exclusively positive nature. A possible explanation for this is that as compared with other earliest indicators of mother-infant relationship such as attitude towards the pregnancy, mothers' recollection of first contact with their newborns might not capture the same richness of data in term of mother-infant relationship in the Chinese cultures. Antenatal taboos such as dietary and behavioural restrictions (e.g. no construction work in the house, pregnant women

will read beautiful poetry and should never indulge in idle gossip and attend funerals) are commonly practised by pregnant Chinese women in order to protect her unborn child from harmful influences. The traditional Chinese practices extend after childbirth, whereby the mother and her newborn are expected to remain indoors for a month (known as “confinement”), allowing the mother to recover from giving birth and to bond and develop a rich relationship with her newborn. It may be that mothers’ attitude towards pregnancy, through their recollections of adherence to the traditional Chinese practices, gives a better picture of the relation between obstetric history and maternal mind-mindedness.

Consistent with previous findings (Leung, Leung, Chan, Tso, & Ip, 2005), parenting stress was significantly negatively related to SES. Exploring factors relating to the antenatal period may help us to understand individual differences in parenting stress. The present study revealed that mothers who displayed a highly emotional reaction of an exclusively positive nature were in the lower parent distress category and experienced lower total parenting stress scores than those who responded neutrally when their babies were first given to them.

Mothers’ pre-baby expectations shape how they feel after childbirth. Mothers who experienced little discrepancies between pre-baby expectations and postpartum realities might have positive perception of their newborns. Having positive perception might have influenced their parenting style which in turn contributed to less distress and total parenting stress. Another possible explanation for this is the level of support from family and friends. The current results showed that among mothers who recollected neutral reactions to first contact with the child, those who were not the main carers and received support from family (childcare provided by grandparents) experienced less parental distress than mothers who were the main carers of their infants. Interestingly, mothers who were not main carers and who had recollected neutral reactions to first contact with the child experienced more parent-child dysfunctional interaction than mothers who were main carers. Less time spent together

with their infants might have contributed to parent-child dysfunctional interaction. Our results highlight the importance of considering parent-related factors such as level of childcare from grandparents influencing parenting stress.

The second objective of the present study was to explore whether maternal mind-mindedness was related to parenting stress. Mothers in the lowest income group rated their children as more difficult and faced higher parenting stress than mothers in the highest income group. Replicating previous research (McMahon & Meins, 2012), the current study found that parenting stress was significantly negatively correlated with scores for appropriate mind-related comments, when maternal education was entered as a covariate. Mothers who were more mind-mindedness had lower levels of parenting stress, with mothers in the extremely low stress group obtaining higher scores for appropriate mind-related comments than those in the high average stress group. These results confirm the association between maternal mind-mindedness and parenting stress reported in Western culture (McMahon & Meins, 2012). As McMahon and Meins (2012) have argued, being mind-minded enables the parents to ‘tune in’ to the thoughts and feelings of their child, making the parents less critical of their child’s negative behaviours. One interesting finding is that when maternal education and income were entered as covariates, there was no significant relation between maternal appropriate mind-mindedness comments and parenting stress total status. McMahon and Meins’ (2012) study included only maternal education as a covariate. Given that higher income was associated with lower parenting stress total status, it would have cancelled out the relationship between parenting stress and maternal minded-mindedness. The present results highlight the importance of considering socio-economic factors, beyond maternal education, affecting parenting and parent-child interaction. Parson et al.’s (2013) review of prevalence rates of postnatal depression in low- and middle-income countries showed that

postnatal depression could have adverse impact on child development outcomes (poor infant physical growth, lower cognitive and emotional development).

Future Research

The present cross-sectional study could not determine the longitudinal relation between early maternal mind-mindedness and children's later development. Several Western studies have found longitudinal relation between early maternal mind-mindedness during infancy and children's later understanding of the mind (Kirk et al., 2015; Laranjo et al., 2010; Laranjo et al., 2014; Meins et al., 2013). British mothers' use of appropriate mental state comments when their infants were 6 months of age predicted subsequent theory of mind performance at 45 and 48 months of age (Meins et al., 2002). To date, a few published studies have explored the relation between maternal mind-mindedness during infancy and children's acquisition of different aspects of theory of mind in the non-Western cultures. A longitudinal study of a small sample of 38 Japanese mothers' use of internal state language with their infants at 6 and 9 months predicted children's developing understanding of other people's emotion at age 4 (Shinohara, 2011). Cross-cultural studies have reported variations in children's theory of mind development (Lim, 2011, 2014; Shahaeian, Peterson, Slaughter, & Wellman, Fang, Liu, Zhu, & Liu, 2011; Wellman et al., 2006). It would be interesting to explore cross-cultural similarities and differences in the longitudinal relations between early maternal mind-mindedness and children's later theory of mind development.

The current study did not ask mothers to report on children's acquisition of words relating to internal states. Further work needs to be done to establish whether Chinese children's early understanding of internal states (as assessed through internal state language) is associated with maternal mind-mindedness, such as those reported in Western studies (e.g. Meins et al., 2013).

Despite the benefits of positive fathers' involvement in child development (Cabrera, Tamis-LeMonda, Bradley, Hofferth, & Lamb, 2000; Lamb & Tamis-LeMonda, 2004), there were only a few Western studies that explored paternal mind-mindedness (Arnott & Meins, 2007; Lundy, 2003, 2013; Sethna, Murray & Ramchandani, 2012). There has been no published data on paternal mind-mindedness during infancy in non-Western cultures. Cultural tradition and ongoing social changes shape fathers' role in China (Li & Lamb, 2013, 2015; Wu, An & An, 2013). Further research investigating paternal mind-mindedness needs to be done to establish whether there are cultural similarities or differences in fathers' abilities to "read" their young children's thinking and feelings. Moreover, there were a few studies comparing the similarities and differences between maternal and paternal mind-mindedness in the Western cultures (Arnott & Meins, 2007; Lundy, 2003, 2013). A comparative study of mothers' and fathers' abilities to interpret their child's internal states accurately in the non-Western cultures would be very interesting.

Conclusions

As human beings have the natural selected instinct to recognise life as unique, one would assume that showing mind-mindedness or treating infants as individuals with minds of their own is the norm rather than the exception. The present study showed that although maternal mind-mindedness might be a universal phenomenon, there are cultural variations in the ways they develop. Similar to Western mothers, Chinese mothers' mind-mindedness is shaped by their experiences of pregnancy, birth and early parenting. Cultural beliefs about pregnancy and child care practices might influence a mother's relationship with her child. The present results highlight the importance of considering parent-related factors such as level of child care support from grandparents and income when examining antenatal perceptions and postpartum parenting stress and maternal mind-mindedness.

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Table 1

Demographic Information of Mothers

Education	Below university	University	Postgraduate
(<i>N</i> = 94)*	45 (47.9%)	33 (35.1%)	16 (17%)
Family income	< 100,000 rmb	10,000rmb - 30,000 rmb	> 30,000 rmb (approx.
(<i>N</i> = 95)*	(approx.	(approx. USD15,600 to	USD46,750)
	USD15,600)	USD46,750)	9 (9.5%)
	30 (31.6%)	56 (58.9%)	
Profession	Full-time mother	Full-time job	
(<i>N</i> = 86)*	18 (20.9%)	68 (79.1%)	
Number of children	Only one child	Two children	
(<i>N</i> = 96)	83 (86.5%)	13 (13.5%)	
Main carer	Self	Grandparents	Other relatives
(<i>N</i> = 95)*	58 (61.1%)	36 (37.9%)	1 (1.1%)
Living with parents	Yes	No	
(<i>N</i> = 95)*	70 (73.7%)	25 (26.3%)	
Hours spent with	<i>M</i> = 12.44, <i>SD</i> = 9.12		
children per day (<i>N</i>	Range: 0 - 24		
= 93)*			

Note: * Mothers were encouraged to complete all demographic questions. However, some mothers did not want to answer a few questions because of personal reasons.

Table 2

Results of ANOVA between Income, Maternal Education, Parenting Stress and Maternal Mind-Mindedness

	Income	Maternal education
Difficult child	$F(2,94) = 4.66, p < .05, \eta^2 = .09$	$F(2,93) = .39, p = .68, \eta^2 = .01$
Parent-child dysfunctional interaction	$F(2,94) = 1.68, p = .19, \eta^2 = .04$	$F(2,93) = 1.63, p = .20, \eta^2 = .04$
Parent distress	$F(2,94) = 4.18, p < .05, \eta^2 = .08$	$F(2,93) = .53, p = .59, \eta^2 = .01$
Parenting stress total status	$F(2,94) = 4.93, p < .01, \eta^2 = .10$	$F(2,93) = 1.36, p = .26, \eta^2 = .03$
Appropriate mind-related comments (Total)	$F(2,93) = 1.11, p = .33, \eta^2 = .02$	$F(2,90) = 3.53, p < .05, \eta^2 = .07$
Appropriate mind-related comments (%)	$F(2,92) = .10, p = .90, \eta^2 = .002$	$F(2,91) = 2.97, p = .06, \eta^2 = .06$
Non-attuned mind-related comments (Total)	$F(2,93) = 2.39, p = .10, \eta^2 = .05$	$F(2,90) = .17, p = .85, \eta^2 = .004$
Non-attuned mind-related comments (%)	$F(2,92) = 2.21, p = .12, \eta^2 = .05$	$F(2,91) = .87, p = .42, \eta^2 = .02$
Total utterances	$F(2,94) = 1.14, p = .32, \eta^2 = .02$	$F(2,93) = .46, p = .63, \eta^2 = .01$

Table 3

Results of ANCOVAs Between Obstetric History and Maternal Mind-mindedness

	<u>Appropriate mind-</u> <u>mindedness</u> <u>comments (%)</u>		<u>Non-attuned mind-</u> <u>mindedness</u> <u>comments (%)</u>	
	<i>F</i>	η^2	<i>F</i>	η^2
<u>Main effects</u>				
Planned pregnancy	.29	.004	2.31	.03
Pregnancy evaluation	8.62**	.10	.01	.00
Feelings at birth	.55	.03	.68	.04
<u>Interactions</u>				
Planned pregnancy X Pregnancy Evaluation	4.53*	.06	1.68	.02
Planned pregnancy X Feelings at birth	.57	.02	1.56	.06
Pregnancy Evaluation X Feelings at birth	3.21*	.11	.37	.02
Planned pregnancy X pregnancy evaluation X Feelings at birth	3.08	.07	.32	.01
* $p < .05$, ** $p < .005$				

Table 4

Partial Correlations, Controlling for Maternal Education and Income, Between Parenting Stress and Maternal Mind-Mindedness

	Parenting Stress Index					Maternal Mindedness			
	1	2	3	4	5	6	7	8	9
<u>Parenting Stress Index</u>									
1. Parental distress	-								
2. Parent-child interaction	.35**	-							
3. Difficult child	.27*	.61***	-						
4. Parenting stress total status	.63***	.76***	.73***	-					
<u>Maternal Mindedness</u>									
5. Appropriate mind-related comments (total)	-.15	-.19	-.14	-.20	-				
6. Appropriate mind-related comments (%)	-.13	-.23*	-.17	-.22*	.73***	-			
7. Non-attuned mind-related comments (total)	-.18	-.02	-.10	-.11	.08	.01	-		
8. Non-attuned mind-related comments (%)	-.15	.08	-.08	-.01	-.03	.03	.83***	-	
9. Total utterances	-.21	-.13	-.10	-.20	.58***	.09	.12	-.05	-

* $p < .05$, ** $p < .005$, *** $p < .001$